

PostgreSQL: Future DBMS Technology Today





PostgreSQL is:

the most advanced open source database management system

a pioneering Object-Relational Database Management System

full-featured, safe, stable and powerful

highly extensible



Background:

born at the University of California at Berkeley

started in 1986, by Michael Stonebraker as a successor to the Ingres database system

originally conceived as an RDBMS with object-oriented capabilities

in 1994, SQL was added, and Postgres95 would come to be known as PostgreSQL



Licensing:

PostgreSQL is open source software

anyone can download the source code and modify it to suit their own needs

programmers from around the world contribute to its codebase, fix bugs, and improve on its functionality



Features:

What makes PostgreSQL different?

as powerful and dependable as commercial RDBMS

offers commit/rollback transactions, subselects, triggers, views, foreign key referential integrity, and sophisticated record locking

utilizes features that far exceed those of common relational database systems



Features: (continued)

supports 45 different data types

data types for describing geometric objects, such as POINT, POLYGON, and CIRCLE, and user-defined data types

internet age data types, such as INET and CIDR, which contains IP address and netmask information

primary keys are not implemented, but a special type called OID (object identifier) keeps track of unique records



Advanced Features:

implements object inheritance

```
CREATE TABLE cities (  
    name            text,  
    population      real,  
    altitude        int  
);  
  
CREATE TABLE capitals (  
    state           char(2)  
) INHERITS (cities);
```



Advanced Features:

columns can contain non-atomic one-dimensional or multi-dimensional arrays of basic data types

```
CREATE TABLE sal_emp (  
    name                text,  
    pay_by_quarter      integer[],  
    schedule            tex[][]  
);
```

```
INSERT INTO sal_emp VALUES ('Carol', '{2000, 25000,  
25000, 25000}', '{{"talk", "consult"}, {meeting"}}
```

```
SELECT name  
FROM sal_emp WHERE sal_emp.pay_by_quarter[1] <>  
sal_emp.pay_by_quarter[2];
```




Advanced Features:

Multi-Version Concurrency Control, which aids database performance in a multi-user environment

tools that can optimize database planning

ability for users to extend the functions used to interact with the database



Advantages:

its open source nature insures a quicker development cycle, and thus more frequent updates

language interfaces for popular programming languages, including Perl, Python, PHP, and Java via JDBC, C/C++, Embedded C, and TCL

can easily handle large amounts of data

best of all, it's free



Disadvantages:

lack of documentation

steep learning curve

lack of commercial support

somewhat slower than other RDBMS used
in web application.



Conclusion:

PostgreSQL will continue to lead database technology into the future

its features and advantages greatly out-weigh its disadvantages

it is a terrific platform for students to learn the ins and outs of a powerful database system

Postgres will continue to evolve as we move towards the future of database technology